

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding an APS reductase comprising a member selected from the group consisting of:

- 5 (a) an isolated nucleic acid fragment encoding an amino acid sequence that is at least 80% identical to the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6, 8 and 10;
- (b) an isolated nucleic acid fragment that is complementary to (a).

10 2. The isolated nucleic acid fragment of Claim 1 wherein nucleic acid fragment is a functional RNA.

3. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, 3, 5, 7 and 9.

15 4. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.

5. A transformed host cell comprising the chimeric gene of Claim 4.

6. An APS reductase polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID
20 NO:2, 4, 6, 8 and 10.

7. A method of altering the level of expression of a sulfate assimilation protein in a host cell comprising:

- (a) transforming a host cell with the chimeric gene of Claim 4; and
- (b) growing the transformed host cell produced in step (a) under conditions
25 that are suitable for expression of the chimeric gene
- wherein expression of the chimeric gene results in production of altered levels of a sulfate assimilation protein in the transformed host cell.

8. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a sulfate assimilation protein comprising:

- 30 (a) probing a cDNA or genomic library with the nucleic acid fragment of Claim 1;
- (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of Claim 1;
- (c) isolating the DNA clone identified in step (b); and
- 35 (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)

wherein the sequenced nucleic acid fragment encodes all or a substantial portion of the amino acid sequence encoding a sulfate assimilation protein.

9. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding a sulfate assimilation protein comprising:

- (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOs:1, 3, 5, 7 and 9; and
- (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector

wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding a sulfate assimilation protein.

10. The product of the method of Claim 8.

11. The product of the method of Claim 9.